

Topic: Power rule for exponents**Question:** Which of the equations are true?**Answer choices:**

A $x^a x^b = x^{a+b}$

B $\frac{x^a}{x^b} = x^{a-b}$

C $(x^a)^b = x^{a \cdot b}$

D All of these



Solution: D

All of these are true rules of exponents.



Topic: Power rule for exponents**Question:** Simplify the expression.

$$(x^a)^b$$

Answer choices:

A x^{a^2}

B x^{2ab}

C x^{2a2b}

D x^{ab}



Solution: D

When you raise an exponential expression to a power, you can apply the power rule for exponents, by multiplying the exponents and keeping the base the same. Given

$$(x^a)^b$$

the base x stays the same and the exponents a and b get multiplied. The result is

$$x^{ab}$$



Topic: Power rule for exponents**Question:** Simplify the expression.

$$(x^a)^{a^2}$$

Answer choices:

A x^{a+a^2}

B x^{2a^2}

C x^{a^3}

D x^a



Solution: C

When you raise an exponent to another exponent, you apply the power rule for exponents, and you multiply the exponents together, keeping the base the same. Given

$$(x^a)^{a^2}$$

the base x stays the same and the exponents a and a^2 get multiplied together. The result is

$$x^{a \cdot a^2}$$

$$x^{a^3}$$

